



**U.S. Department of Energy
Technical Qualification Program**

Occupational Safety Qualification Standard

Study Guide

**Developed by the
*Oak Ridge Operations Office***

April 1996

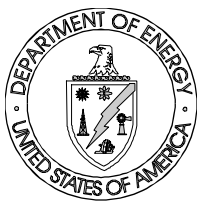


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Section 1.0 General Technical

Competency 1.1	1-1
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Occupational safety personnel shall demonstrate a working level knowledge of electricity and electrical hazards to enable them to develop, implement, and evaluate an electrical safety program.

Competency 1.6	1-9
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Occupational safety personnel shall demonstrate a working level knowledge of ergonomic hazards and the elimination or control of them.

Competency 1.7	1-19
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Occupational safety personnel shall demonstrate a working level knowledge of safety precautions and hazards associated with workplace chemicals.

Competency 1.8	1-31
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Occupational safety personnel shall demonstrate a familiarity level knowledge of the following disciplines that interface with occupational safety:

- **Health Physics**
- **Industrial Hygiene**
- **Occupational Medicine**
- **Safeguards and Security**
- **Environmental Protection**
- **Nuclear Safety**



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Competency 1.9	1-37
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Occupational safety personnel shall demonstrate a working level knowledge of safety in construction operations.

Competency 1.10	1-67
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Occupational safety personnel shall demonstrate a working level knowledge of the application of hazard control methods.

Competency 1.11	1-78
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Occupational safety personnel shall demonstrate familiarity with the application of basic and applied sciences to safety considerations.

Competency 1.12	1-81
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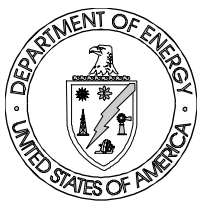
Occupational safety personnel shall demonstrate a working level knowledge of safety considerations associated with industrial operations.

Competency 1.13	1-93
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Occupational safety personnel shall demonstrate a familiarity level knowledge with the use and function of safety related testing and measurement equipment.

Competency 1.14	1-98
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Occupational safety personnel shall demonstrate a working level knowledge of safety in the research and development, manufacture, use, transportation, testing, demilitarization, and disposal of explosives.



Section 2.0 Regulatory

Competency 2.1 2-1

Occupational safety personnel shall demonstrate a working level knowledge of occupational safety-related requirements of Department of Energy (DOE) Orders such as the following:

- **DOE 3790.1B, Federal Employee Occupational Safety and Health Program**
- **DOE 3791.2A, Federal Employee Motor Vehicle Safety Program**
- **DOE 4330.4A, Maintenance Management Program**
- **DOE 4700.1, Project Management System**
- **DOE 5000.3B, Occurrence Reporting and Processing of Operations Information**
- **DOE 5480.1B, Environment, Safety and Health Program for Department of Energy Operations**
- **DOE 5480.3, Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes**
- **DOE 5480.4, Environmental Protection, Safety, and Health Protection Standards**
- **DOE 5480.5, Safety of Nuclear Facilities**
- **DOE 5480.7A, Fire Protection**
- **DOE 5480.8A, Contractor Occupational Medical Program**
- **DOE 5480.9A, Construction Project Safety and Health Management**
- **DOE 5480.10, Contractor Industrial Hygiene Program**
- **DOE 5480.19, Conduct of Operations Requirements for DOE Facilities**
- **DOE 5480.20, Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities**
- **DOE 5480.23, Nuclear Safety Analysis Reports**
- **DOE 5480.29, Employee Concerns Management System**
- **DOE 5481.1B, Safety Analysis and Review System**
- **DOE 5482.1B, Environment, Safety and Health Appraisal Program**
- **DOE 5483.1A, Occupational Safety and Health Program for DOE Contractor Employees**
- **DOE 5484.1, Environmental Protection, Safety, and Health Protection Information Reporting Requirements**
- **DOE 5500.1B, Emergency Management System**
- **Emergency Categories, Classes, and Notification and Reporting Requirements**
- **DOE 5500.3A, Planning and Preparedness for Operational Emergencies**

Competency 2.2 2-15

Occupational safety personnel shall demonstrate a working level knowledge of the

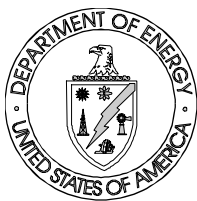


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organization and application of Occupational Safety and Health Administration Regulations.

Competency 2.3	2-19
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Occupational safety personnel shall demonstrate a familiarity level of knowledge with the following:

- **29 CFR 1910, Occupational Safety and Health Standards, Subpart Z - Toxic and Hazardous Substances (1910.1000 through 1910.1048)**
- **29 CFR 1926, Safety and Health Regulations for Construction, Subpart Z - Toxic and Hazardous Substances**
- **American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) for chemical substances and Physical Agents and Biological Exposure Indices (herein after referred to as the ACGIH TLV Booklet)**

Competency 2.4	2-23
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Occupational safety personnel shall demonstrate the ability to apply and implement occupational safety related sections and/or requirements of Orders, codes, standards, and regulations for a given industry, operation, facility, or hazard.

Competency 2.5	2-30
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Occupational safety personnel shall demonstrate the ability to oversee contractor safety programs and determine the adequacy of local compliance with the occupational safety-related requirements of Orders, codes, standards, and regulations.

Section 3.0 Administrative

Competency 3.2	3-1
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Occupational safety personnel shall demonstrate a familiarity with accident and incident reporting, recording, and data management requirements.

Competency 3.3	3-7
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Occupational safety personnel shall demonstrate a familiarity level knowledge with the training and qualification program(s) requirements for occupational safety professionals.



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Section 4.0 Management, Assessment, and Oversight

Competency 4.1	4-1
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Occupational safety personnel shall demonstrate a working level knowledge of the development and management of both the technical and programmatic elements of an occupational safety program.

Competency 4.2	4-16
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Occupational safety personnel shall demonstrate the ability to perform occupational safety trend analyses.

Section 5.0 Topical Competencies

Chemical Processing Competency 1.10	CP 1-1
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Chemical Processing personnel shall demonstrate a familiarity level knowledge of the requirements for using personal protective equipment (PPE).

Chemical Processing Competency 2.9	CP 1-8
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Chemical processing personnel shall demonstrate the ability to evaluate the adequacy of local compliance with the following sections of 29 CFR 1910, Occupational Safety and Health Standards:

- **1910.119, Process Safety Management of Highly Hazardous Chemicals**
- **1910.120, Hazardous Waste Operations and Emergency Response**
- **1910.1200, Hazard Communication**

Civil/Structural Engineering Competency 2.5	CS 1-1
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Civil/structural engineering personnel shall demonstrate a familiarity level knowledge of the Occupational Safety and Health Act (OSHA).



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Construction Management and Engineering Competency 2.9	CM 1-1
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Construction management and engineering personnel shall demonstrate a familiarity level knowledge of the Occupational Safety and Health Act (OSHA) requirements in the following chapters of the Code of Federal Regulations:

- **29 CFR 1910, Occupational Safety and Health Standards**
- **29 CFR 1926, Safety and Health Regulations for Construction**

Construction Management and Engineering Competency 2.17	CM 1-9
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Construction management and engineering personnel shall demonstrate a working level knowledge of Department of Energy (DOE) Order 5480.9A, Construction Project Safety and Health Management.

Environment, Safety, and Health Resident Competency 1.17	EH 1-1
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EH Residents shall demonstrate a working level knowledge of safety precautions and hazards associated with chemicals, compounds, and compressed gases.

Environment, Safety, and Health Resident Competency 1.18	EH 1-19
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EH Residents shall demonstrate the ability to recognize fall hazards and identify the appropriate protective measures and/or systems.

Environment, Safety, and Health Resident Competency 1.19	EH 1-24
----------------------------------------------------------------	---------

EH Residents shall demonstrate a working level knowledge of the requirements for using personal protective equipment (PPE).

Environment, Safety, and Health Resident Competency 1.20	EH 1-40
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EH Residents shall demonstrate a familiarity level knowledge of the safety hazards associated with welding.

Environment, Safety, and Health Resident Competency 1.21	EH 1-45
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EH Residents shall demonstrate a familiarity level knowledge of the safety hazards associated with materials handling and storage.

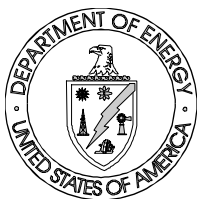


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Environment, Safety, and Health Resident Competency 1.22	EH 1-52
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EH Residents shall demonstrate a familiarity level knowledge of the safety hazards associated with machinery and machine guarding.

Environment, Safety, and Health Resident Competency 1.23	EH 1-61
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EH Residents shall demonstrate a familiarity level knowledge of the safety hazards associated with hand and portable tools.

Environment, Safety, and Health Resident Competency 1.24	EH 1-65
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EH Residents shall demonstrate a familiarity level knowledge of the safety hazards associated with walking and working surfaces.

Environment, Safety, and Health Resident Competency 1.25	EH 1-74
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EH Residents shall demonstrate a working level knowledge of hazard communication (HAZCOM).

Environment, Safety, and Health Resident Competency 1.26	EH 1-83
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EH Residents shall demonstrate a working level knowledge of electrical safety.

Environment, Safety, and Health Resident Competency 1.29	EH 1-90
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EH Residents shall demonstrate a familiarity level knowledge of safety in specialized construction activities.

Environment, Safety, and Health Resident Competency 2.8	EH 1-97
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EH Residents shall demonstrate a familiarity level knowledge of the requirements for occupational safety and health in the following Department of Energy (DOE) Orders:

- **DOE Order 5480.8A, Contractor Occupational Medical Program**
- **DOE Order 5480.9A, Construction Safety and Health Program**
- **DOE Order 5480.10, Contractor Industrial Hygiene Program**
- **DOE Order 5483.1A, Occupational Safety and Health Program for DOE Employees at Government-Owned Contractor-Operated Facilities**



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Environment, Safety, and Health Resident Competency 2.18	EH 1-102
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EH Residents shall demonstrate the ability to evaluate hazardous energy control programs in accordance with the following regulation and Department of Energy (DOE) Order:

- **29 CFR 1910.147, Hazardous Energy Control**
- **DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities**

Environment, Safety, and Health Resident Competency 4.6	EH 1-116
---------------------------------------------------------------	----------

EH Residents shall demonstrate the ability to conduct inspections on the use of personal protective equipment (PPE).

General Technical Base Competency 5.1	GT 1-1
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Personnel shall demonstrate knowledge of the Occupational Safety and Health Act (OSHA) necessary to identify safe/unsafe work practices.

General Technical Base Competency 5.3	GT 1-7
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Personnel shall demonstrate knowledge of the principles of electrical safety, referring to OSHA standards and the National Electrical Code, necessary to identify safe/unsafe work practices.

General Technical Base Competency 5.6	GT 1-11
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Using the Department of Energy Hoisting and Rigging Manual, personnel shall demonstrate knowledge of the principles of material handling, hoisting, and rigging necessary to identify safe/unsafe work practices.

Industrial Hygiene Competency 1.10	IH 1-1
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Industrial hygiene personnel shall demonstrate a working level knowledge of personnel protective equipment (PPE) and the programs used to control exposures within acceptable levels.

Mechanical Systems Competency 1.20	MS 1-1
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Mechanical systems personnel shall demonstrate a working level knowledge of the safety and health fundamentals of mechanical systems and/or components.



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Nuclear Explosives Competency 2.11	NE 1-1
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Nuclear Explosives safety personnel shall demonstrate a familiarity level knowledge of the following Department of Energy directives:

- **DOE Order 5483.1A, Occupational Safety and Health Program for DOE contractor Employees at Government-Owned Contractor-Operated Facilities**
- **DOE Order 5480.11, Radiation Protection of the Public and the Environment**
- **DOE/EV/06194, DOE Explosive Safety Manual**

Project Management Competency 2.8	PM 1-1
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Project management personnel shall demonstrate a familiarity level knowledge of the Occupational Safety & Health Act (OSHA) requirements contained in the following documents:

- **Department of Energy (DOE) Order 5480.9, Construction Project Safety and Health Management**
- **29 CFR 1910, Occupational Safety and Health Standards**
- **29 CFR 1926, Safety and Health Regulations for Construction**

Waste Management Competency 2.21	WM 1-1
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Waste management personnel shall demonstrate a familiarity level knowledge of the Occupational Safety and Health Act (OSHA).

<i>Appendix A Glossary</i>	A-1
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<i>Appendix B Training-to-Competency Matrix</i>	B-1
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**U.S. Department of Energy
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Occupational Safety Qualification Standard

Study Guide

Introduction

April 1996



1. Scope

This study guide encompasses the following competencies related to occupational safety:

- Occupational Safety 1.1, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 2.1, 2.2, 2.3, 2.4, 2.5, 3.2, 3.3, 4.1, and 4.2
- Civil/Structural Engineering 2.5
- Construction Management 2.9 and 2.17
- EH Resident 1.17, 1.18, 1.19, 1.20, 1.21, 1.22, 1.23, 1.24, 1.25, 1.26, 1.29, 2.8, 2.18, and 4.6
- General Technical Base 5.1, 5.3, and 5.6
- Industrial Hygiene 1.10
- Mechanical Systems 1.20
- Project Management 2.8
- Waste Management 2.21

These occupational safety competencies can be attained and demonstrated by three methods: competency equivalency documented by previous training, education, and experience; competency evaluation of knowledge and skills using examinations, performance demonstrations, or evaluations; and competency exemption, which is a written release from the requirement to meet a specific competency. Some general examples of these methods include documentation of equivalent training or education, a test-out or challenge test, a requirement waiver, completion of applicable coursework, and other learning activities such as this study guide.

2. Purpose

The purpose of this study guide is twofold:

- To identify the training content and associated self-study activities that will promote the learning of the skills and knowledge associated with the occupational safety competencies
- To provide a matrix to existing comparable and applicable learning activities (such as training or education courses) and materials, which can then be used to satisfy the competency requirements.



3. References

- a. 29 *Code of Federal Regulations* (CFR) 1910, "Occupational Safety and Health Standards for General Industry."
- b. 29 CFR 1926, "Safety and Health Regulations for Construction."
- c. 40 CFR 61, "National Emission Standards for Hazardous Air Pollutants."
- d. *American Conference of Government Industrial Hygienists Threshold Limit Values (ACGIH TLVs)* Booklet.
- e. American National Standards Institute (ANSI) Z88.2-1980, *Practices for Respiratory Protection*.
- f. DOE Order 232.1, *Occurrence Reporting and Processing of Operations Information*.
- g. DOE Order 360.1, *Training*.
- h. DOE Order 1540.2, *Hazardous Material Packaging for Transport - Administrative Procedures*.
- i. DOE Order 3790.1B, *Federal Employee Occupational Safety and Health Program*.
- j. DOE Order 3791.2A, *Federal Employee Motor Vehicle Safety Program*.
- k. DOE Order 4330.4B, *Maintenance Management Program*.
- l. DOE Order 4700.1, *Project Management System*.
- m. DOE Order 5000.3B, *Occurrence Reporting and Processing of Operations Information*.
- n. DOE Order 5480.1B, *Environment, Safety and Health Program for Department of Energy Operations*.
- o. DOE Order 5480.3, *Safety Requirements for the Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes*.
- p. DOE Order 5480.4, *Environmental Protection, Safety, and Health Protection Standards*.



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- q. DOE Order 5480.5, *Safety of Nuclear Facilities*.
- r. DOE Order 5480.7A, *Fire Protection*.
- s. DOE Order 5480.8A, *Contractor Occupational Medical Program*.
- t. DOE Order 5480.9A, *Construction Project Safety and Health Management*.
- u. DOE Order 5480.10, *Contractor Industrial Hygiene Program*.
- v. DOE Order 5480.18B, *Nuclear Facility Training Accreditation Program*, August 1994.
- w. DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*.
- x. DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*.
- y. DOE Order 5480.23, *Nuclear Safety Analysis Reports*.
- z. DOE Order 5480.26, *Trending and Analysis of Operations Information Using Performance Indicators*.
- aa. DOE Order 5480.29, *Employee Concerns Management System*.
- ab. DOE Order 5481.1B, *Safety Analysis and Review System*.
- ac. DOE Order 5482.1B, *Environment, Safety, and Health Appraisal Program*.
- ad. DOE Order 5483.1A, *Occupational Safety and Health Program for DOE Contractor Employees*.
- ae. DOE Order 5484.1, *Environmental Protection, Safety, and Health Protection Information Reporting. Requirements*
- af. DOE Order 5500.2B, *Emergency Categories, Classes, and Notification and Reporting Requirements*, February 1992.
- ag. DOE Order 5500.1C (Draft), *Emergency Management System*.
- ah. DOE Order 5500.3A, *Planning and Preparedness For Operational Emergencies*.



- ai. DOE Order 5630.11B, *Safeguards and Security Program*.
- aj. DOE/EV/06194, *DOE Explosives Safety Manual*, Revision 7.
- ak. DOE/ID-10500, *Department of Energy Hoisting and Rigging Manual*.
- al. DOE/ID-10600, *Electrical Safety Guidelines*.
- am. DOE-HDBK-1014-92, *Fundamentals Handbook*, "Mathematics," Volumes 1 and 2.
- an. DOE-HDBK-110-92, *Fundamentals Handbook*, "Classical Physics."
- ao. DOE-HDBK-1015-93, *Fundamentals Handbook*, "Chemistry," Volumes 1 and 2.
- ap. DOE-STD-1007-92, *Guide to Good Practices for Teamwork Training and Diagnostics Skills Development*.
- aq. DOE-STD-1048-92, *DOE Performance Indicators Guidance Document*.
- ar. Environment, Safety and Health Safety Bulletin, 92-4, DOE/EH-0266, "DOE Quality Alert."
- as. Environment, Safety and Health Safety Bulletin, 93-6, DOE/EH-0342, "Take Special Care When Using Cranes."
- at. *Industrial Toxicology, Safety, and Health Applications in the Workplace*, edited by Phillip L. Williams and James L. Burson, Van Nostrand Reinhold, New York, 1985.
- au. National Institute for Occupational Safety and Health (NIOSH) Pub. No. 80-106, *Criteria for Recommended Standard: Working in Confined Spaces*.
- av. NIOSH Publication 94-116, *Pocket Guide to Chemical Hazards*.
- aw. NIOSH/OSHA/USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*.
- ax. National Safety Council. *Fundamentals of Industrial Hygiene*, 4th edition. Edited by Barbara A. Plog, 1996.
- ay. Occupational Safety and Health Administration (OSHA) Standard, "Ergonomics



Protection” (proposed).

az. OSHA Standard 1910.109, “Explosives and Blasting Agents.”

ba. Occupational Safety and Health Administration (OSHA) Standard 2202, “Construction Industry.”

bb.OSHA 2209, “OSHA Handbook for Small Businesses.”

bc. Occupational Safety and Health Administration (OSHA) *Technical Manual*, 2nd edition.

bd.“Safety and Health Regulations for Construction,” Subpart K, “Electrical,” 29 CFR 1926, *Surveillance Guide*, prepared by the DOE Oak Ridge Field Office.

be. U.S. Department of Energy, EM-450, *Health and Safety Plan Guidelines*.

bf. U.S. Department of Energy, Oak Ridge Operations Office, *Machinery and Machine Guarding Surveillance Guide*.

bg.U.S. Department of Energy, Office of Emergency Planning and Operations, *Emergency Management Guide*, February 1995.

bh.U.S. Department of Energy Standard, *Ergonomic Protection* (proposed).

4. How to Use This Study Guide

- a. Read this guide and complete the associated learning activities for those competencies you wish to satisfy through self-study. As you need to, refer to the glossary located in Appendix A, which contains the standard definitions.
- b. For assistance or additional information, contact your supervisor or subject matter experts at your facility or site, or refer to identified resources in the Training-to-Competency Matrix, located in Appendix B.



5. DOE Orders in Transition

DOE Orders are in a state of transition. However, Order cancellation does not necessarily mean that the Order is no longer in effect. For example, DOE O 440.1, *Worker Safety and Health Program*, which cancels seven occupational safety-related Orders, states:

“Cancellation of an Order does not, by itself, modify or otherwise affect any contractual obligation to comply with such an Order. Canceled Orders that are incorporated by reference in a contract shall remain in effect until the contract is modified to delete the reference to the requirements in the canceled Orders.”

This study guide refers to both the old and new Orders. There are three reasons for this: (1) as stated above, many facilities are contractually obligated to follow the old Orders, (2) the replacement process is dynamic and will continue for some time, and (3) the old Orders are often content-oriented and house the in-depth details regarding processes and procedures.

Rather than publish a matrix of new and old Orders within this study guide, participants should refer to the document “*Crosswalk of Old Directives Numbers to New Directives Numbering System*.” This is an excellent resource. It is linked to the DOE homepage “Clearinghouse for Training, Education and Development” or may be reached directly at the following gopher site:

`gopher://VM1.HQADMIN.DOE.GOV:70/00/doemenu1/directiv/251cross.asc`